

Amendment dated January 24, 2012

Reply to Office Action of November 8, 2011

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A device that supplies mixed gas to radiant heating type gas burners having a housing, a plurality of burner assemblies in the housing for combustion of the mixed gas therein, each of the plurality of burner assemblies having a burner chamber that receives a mixture of fuel gas and air therein, and a glass plate placed on top of the housing, the device comprising:

a plurality of mixing tubes respectively in communication with the plurality of burner chambers for supplying the fuel gas and air thereto;

a plurality of gas nozzles for respectively spraying the fuel gas into the plurality of mixing tubes;

a plurality of air supply tubes for respectively directing air toward the plurality of mixing tubes, wherein a first end of each of the plurality of mixing tubes is coupled to a corresponding burner chamber and a first end of each of the plurality of air supply tubes is coaxially aligned with a second end of a corresponding mixing tube, with a predetermined gap formed therebetween, wherein a cross sectional area enclosed by an inner diameter of the first end of each air supply tube, facing the second end of the respective mixing tube, is greater than a cross sectional area enclosed by an inner diameter of the second end of the respective mixing tube;

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a plurality of air passages defined by the predetermined gaps formed between the air supply tubes and the mixing tubes, wherein air outside of the plurality of mixing tubes and within the housing is drawn through the plurality of air passages and into the plurality of mixing tubes by a pressure difference between the outside and inside of the plurality of mixing tubes; and

at least one fan in communication with a second end of at least one of the plurality of air supply tubes for supplying air thereto.

2. (Previously Presented) The device as claimed in claim 1, wherein the predetermined gap formed between the first end of each air supply tube and the second end of the respective mixing tube is formed in a radial direction.

3. (Previously Presented) The device as claimed in claim 1, wherein the predetermined gap formed between the first end of each air supply tube and the second end of the respective mixing tube is formed in a longitudinal direction.

4. (Previously Presented) The device as claimed in claim 1, wherein the at least one fan is provided at an outside of the housing.

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5. (Previously Presented) The device as claimed in claim 1, further comprising at least one air supply chamber formed between the plurality of air supply tubes and the at least one fan so as to provide air from the at least one fan to the plurality of air supply tubes.

6. (Cancelled)

7. (Previously Presented) The device as claimed in claim 1, further comprising at least one branch tube having a first end connected to the at least one fan, and a second end in communication with the plurality of air supply tubes so as to distribute air from the at least one fan to the plurality of air supply tubes.

8. (Previously Presented) The device as claimed in claim 1, further comprising a plurality of connecting members that each connect a mixing tube of the plurality of mixing tubes to a corresponding air supply tube.

9. (Previously Presented) The device as claimed in claim 8, wherein each of the plurality of connecting members includes a nozzle holding member that holds a corresponding gas nozzle of the plurality of gas nozzles.

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10. (Previously Presented) The device as claimed in claim 8, further comprising a fastening device that fastens each connecting member to a respective mixing tube and air supply tube.

11. (Previously Presented) The device as claimed in claim 8, wherein each mixing tube, corresponding air supply tube, and corresponding connecting member form a mixing tube assembly having two symmetric members bonded together.

12. (Previously Presented) The device as claimed in claim 11, wherein the mixing tube assembly comprises:

a first mixing tube assembly having a first mixing tube part forming a first half of the mixing tube, a first air supply tube part forming a first half of the air supply tube, and a plate shaped first connection member that extends outward from two opposite sides of the first mixing tube part and the first air supply part as a single unit so as to connect the first mixing tube part and the first air supply part as a single unit; and

a second mixing tube assembly having a second mixing tube part forming a second half of the mixing tube, a second air supply tube part forming a second half of the air supply tube, and a plate shaped second connection member that extends outward from two opposite sides of the second mixing tube part and the second air supply part as a single unit so as to connect the

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second mixing tube part and the second air supply part as a single unit, wherein the second connection member is bonded with the first connection member.

13. (Previously Presented) The device as claimed in claim 8, wherein each mixing tube, corresponding air supply tube, and corresponding connecting member are injection molded as a single unit.

14. (Cancelled)

15. (Previously Presented) The device as claimed in claim 1, wherein a diameter of the first end of each air supply tube facing the second end of the respective mixing tube is greater than a diameter of other portions of the air supply tube so as to have an expanded tube form.

16. (Previously Presented) The device as claimed in claim 1, wherein the at least one fan includes a variable speed motor that varies a rotation speed of the at least one fan based on a gas spray rate through one or more of the plurality of gas nozzles.

17. (Previously Presented) The device as claimed in claim 1, wherein each of the plurality of mixing tubes is connected to a plurality of air supply tubes for supplying air thereto.

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18. (Currently Amended) A device that supplies mixed gas to radiant heating type gas burners having a housing, a plurality of burner assemblies provided in the housing for combustion of the mixed gas therein, each of the plurality of burner assemblies having a burner chamber that receives a mixture of fuel gas and air therein, and a glass plate positioned on the housing, the device comprising:

a plurality of mixing tubes respectively in communication with the plurality of burner chambers;

a plurality of gas nozzles respectively in communication with the plurality of mixing tubes;

a plurality of air supply tubes each spaced a predetermined distance apart from and coaxially aligned with a corresponding end of a respective mixing tube of the plurality of mixing tubes, wherein a cross sectional area enclosed by an inner diameter of the first end of each air supply tube, facing the second-corresponding end of the respective mixing tube, is greater than a cross sectional area enclosed by an inner diameter of the second-corresponding end of the respective mixing tube;

a plurality of air passages each defined by a predetermined gap formed between one of the plurality of air supply tubes and the respective mixing tube, wherein air outside of the plurality of mixing tubes and within the housing is drawn through the plurality of air passages

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and into the plurality of mixing tubes by a pressure difference between the outside and inside of the plurality of mixing tubes;

at least one fan that supplies air to the plurality of air supply tubes; and

at least one air supply chamber provided between the plurality of air supply tubes and the at least one fan so as to direct air from the fan to the plurality of air supply tubes.

19. (Original) The device as claimed in claim 18, wherein the air supply chamber is integrated inside of the housing.

20. (Original) The device as claimed in claim 18, wherein the air supply chamber has a plurality of air supply tubes of other burner assemblies connected thereto.

21. (Currently Amended) A device that supplies mixed gas to radiant heating type gas burners having a housing, a plurality of burner assemblies provided in the housing, each of the plurality of burner assemblies having a burner chamber that receives a mixture of fuel gas and air therein, and a glass plate positioned on the housing, the device comprising:

a plurality of mixing tubes respectively in communication with the plurality of burner chambers;

a plurality of gas nozzles respectively in communication with the plurality of mixing tubes so as to spray fuel gas therein;

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a plurality of air supply tubes each spaced a predetermined distance apart from and coaxially aligned with a corresponding end of a respective mixing tube of the plurality of mixing tubes, wherein a cross sectional area enclosed by an inner diameter of the first end of each air supply tube, facing the second corresponding end of the respective mixing tube, is greater than a cross sectional area enclosed by an inner diameter of the second corresponding end of the respective mixing tube;

a plurality of air passages each defined by a predetermined gap formed between one of the plurality of air supply tubes and its respective mixing tube, wherein air outside of the plurality of mixing tubes and within the housing is drawn through the plurality of air passages and into the plurality of mixing tubes by a pressure difference between the outside and inside of the plurality of mixing tubes;

a fan in communication with the plurality of air supply tubes; and

at least one branch tube having a first end connected to the fan, and a second end connected to the plurality air supply tubes so as to distribute air from the fan to the plurality of air supply tubes.

22. (Currently Amended) A device that supplies mixed gas to gas burners having a housing, a plurality of burner assemblies provided in the housing and each having a burner chamber that receives a mixture of fuel gas and air therein, and a glass plate positioned on the housing, the device comprising:

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a mixing tube assembly, including:

a mixing tube having a first end in communication with the burner chamber so as to supply fuel gas and air to the burner chamber;

an air supply tube positioned at an outside of the mixing tube and coaxially with the mixing tube such that a concentric gap is formed between a first end of the air supply tube and a second end of the mixing tube in a radial direction, wherein a cross sectional area enclosed by an inner diameter of the first end of the air supply tube is greater than or equal to a cross sectional area enclosed by an inner diameter of the second end of the mixing tube;

an air passage defined by the gap formed between the first end of the air supply tube and the second end of the mixing tube, wherein a pressure difference between the outside and an interior of the mixing tube draws air from outside of the mixing tube and within the housing into the mixing tube through the air passage; and

a connecting member that connects the mixing tube and the air supply tube so as to form a single unit;

a gas nozzle spaced a predetermined distance apart from the mixing tube so as to spray gas toward the mixing tube; and

a fan that blows air into the air supply tube.

23. (Original) The device as claimed in claim 22, wherein the connecting member includes a nozzle holding part for holding the gas nozzle.

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24. (Previously Presented) The device as claimed in claim 22, further comprising a fastening device that fixes the connecting member to opposite side parts of the mixing tube and the air supply tube.

25. (Previously Presented) The device as claimed in claim 22, wherein the mixing tube assembly comprises:

a first mixing tube assembly having a first mixing tube part forming a first half of the mixing tube, a first air supply tube part forming a first half of the air supply tube, and a plate shaped first connection member that extends outward from two opposite sides of the first mixing tube part and the first air supply part as a single unit so as to connect the first mixing tube part and the first air supply part as a single unit; and

a second mixing tube assembly having a second mixing tube part forming a second half of the mixing tube, a second air supply tube part forming a second half of the air supply tube, and a plate shaped second connection member that extends outward from two opposite sides of the second mixing tube part and the second air supply part as a single unit so as to connect the second mixing tube part and the second air supply part as a single unit, wherein the second connection member is bonded with the first connection member.

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26. (Previously Presented) The device as claimed in claim 22, wherein the mixing tube assembly is formed as a single unit by injection molding.

27. (Cancelled)

28. (Previously Presented) The device as claimed in claim 22, wherein a diameter of the first end of the air supply tube facing the second end of the mixing tube is greater than a diameter of other portions thereof such that the air supply tube has an expanded tube form.